Charles W. Kleekamp, P.E. Ret.
Vice President
Cape Clean Air
PO Box 1300, Sandwich, Massachusetts 02563-1300
e-mail: kleekamp@adelphia.net

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Also submitted in hard copy by US Postal Priority Mail with attachments.

Mr. Rodney Cluck, Ph.D.
Project Coordinator
Minerals Management Service
381 Elden Street
MS 4042
Herndon VA, 20164

Subject: Comments on the Notice of Intent to Prepare an EIS on the Cape Wind Project

Dear Dr. Cluck,

The Cape Wind Project has already gone through at least four years of environmental review by the U.S. Army Corps of Engineers and several other state and federal agencies with a release of a 4,000 page Draft EIS in November, 2004. Although some parties have criticized this past process and concluded that the ACoE draft EIS as incomplete or worse, the review process has now, and appropriately so, been transferred to the MMS, your organization, which has had decades of experience in offshore energy development and related environmental impacts.

That being said, I would ask that you **do not start from scratch** for this project, but add to the existing body of review where appropriate with a sense of **responsible urgency**. That is, to take advantage of not only the ACoE efforts but in addition look to the results of the dozen or so offshore wind farms in Europe and their impact on their environment.

I would urge you to support the current size of the project as being reasonable for the area considered and the need for renewable energy and therefore to avoid lengthy and costly examinations of additional alternative sites.

To be specific, please allow me to make the following suggestions for this review.

1. The word “impacts” generally conveys negative or detrimental affects of a project as perceived by regulators and the public at large. I would strongly urge you to consider and include the **beneficial aspects** of the Cape Wind project in this EIS. It could, at least in the public view, be called an **Environmental Impact and Benefit Study,** or more to the point an **Environmental Sustainability Study.**

Indeed, one may consider this EIS and it implication as a step to not only **energy sustainability**, **but for sustainability of the environment and the world as we know it.** Perhaps it is best said in your 1999 report on OCS Resource Management and Sustainable Development with a quote from the Brundtland Commission which defined sustainable development as: *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*

2. In addition I would urge you to consider in this EIS that any perceived negative impacts be **balanced with perspective** on the existing impacts of currently available electrical generation alternatives to the Cape Wind project. In particular, to balance the initiative of the Cape Wind project with the use of fossil fuels for ever increasing electrical generation needs. I would also urge you to balance and place in perspective any negative impacts of the wind project with other events and environmental impacts from fossil fueled generation such as oil spills by tankers and barges (recall the disastrous oil spill of 98,000 gallons of residual fuel oil in Buzzards by the Bouchard barge brining fuel to the Canal power plant in Sandwich in 2003 and the Argo Merchant incident south of Nantucket spilling 6 million gallons of residual fuel oil in 1979).

Again from your report I quote: *"The production and consumption of energy comprise one of the fundamental components of economic development and societal well-being. However, development and use of fossil fuels deplete nonrenewable natural resources. Furthermore, they can entail costs on society, both environmental (e.g., in terms of air and water quality) and social (e.g., in terms of socioeconomic impacts of development on local communities). Therefore, any discussion of sustainable development should consider initiatives in the energy sector."*

Allow me be more specific about the scope of the Cape Wind review you are undertaking. Examples cited here are not to be considered as actual benchmarks for this project but as clarification or suggestions for your consideration of providing balance and perspective with comparisons to alternative electrical energy sources.

1. The purpose and need for the Cape Wind project.

a. The EIS should establish the need for the project based on authoritative agencies and institutions. For example, the New England electrical ISO requirements for near term system needs, and from the final decision of the Massachusetts Facilities Siting Board (EFSB) approval[1] and the need to reduce the cost of energy from conventional sources, the need to reduce the dependency on diminishing conventional energy sources such as oil and natural gas and the importance of independence and security related issues resulting from the importation of such fuels from unstable and unfriendly countries and the impact on our balance of payments to these countries.

   In addition, this EIS should consider the need to reduce unhealthful emissions from conventional power plants since we are in non-attainment of EPA national air quality standards. Note that Cape Cod has the worst air quality indicator (AQI) for ozone in the state of Massachusetts and in fact is numerically 50% worse that in down town Boston (Roxbury)[2]. This sad state of air quality is due largely to the proximity of the Canal and

[1] Final Decision of the Massachusetts Energy Facility Siting Board, EFSB 02-2, May 11, 2005.
[2] Cape Cod Sustainability Indicators Report, An Uncertain Future, 2003, by the Cape Cod Sustainability Indicators Council, Indicator 6, Air Quality, p.8. Report available at http://www.capecodedc.org/SICProject.html

Brayton Point power plants where the emission concentrations are greatest within 5 miles for PM10 and SO2 and peak further downwind for the PM2.5 secondary particles[3]. And in addition, the geography and atmospheric modeling recently completed shows that the air pollution from these plants which may be blown out over the sea in early morning is brought back over the land mass and deposited on the Cape by the afternoon dual sea breezes (one from Cape Cod Bay to the north and the other from Nantucket and Vineyard Sounds to the south[4].

And finally, consider the need to reduce the impact of man made emissions of carbon dioxide on global warming as justified by the consensus of scientific opinion. This is perhaps the single most important long term issue for bringing offshore wind energy to fruition now, starting with the Cape Wind project as the flagship for the nation.

2. Alternatives for Electrical Energy Production

a. The EIS should include the **"no action" alternative.** That is, what is the impact on the needs of New England if the project is not implemented? Include that impact on the stability of the New England grid system as outlined by ISO NE and the resulting need to build more capacity into the market.

Include the impact of the scarcity and current limitations of natural gas supplies to New England particularly in the winter and the impact on the limitations of New England's grid responsiveness.

For example, include the episode of the cold snap of January 14-16, 2004 where some 2,760 MW of generation was off-line for economic outage and only one-third of the gas fired plants were able to make it back online. The price of natural gas peaked at $63/mmbtu and rolling blackouts were only narrowly averted[5]. The conclusion of an analysis by the U.S. Department of Energy was that if the Cape Wind project were online at the time it would have made a significant contribution to the power supply and reliability of the regional grid. Over that three day period the project would have delivered 25,596 MWh of power and averaged 396 megawatts of power per hour[6].

Include the impact on the continuing increasing cost of electrical energy from oil and natural gas fired generators, the national impact of continuing to import oil and natural gas with respect to cost and national security, and the impact of depending on unstable and unfriendly foreign sources, the environmental impact of continuing "business as usual," (for example, the environmental impact of fuel oil tanker and barges running aground as in the history of grounding and spills in the Cape Cod Canal and Buzzards Bay, the impact of an explosion of an LNG tanker in Fall River or Boston, etc. and the impact on health effects from the continuing use of fossil fuels.

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[3] "Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants," Levy and Spengler, Harvard School of Public Health, May 2000, p.4.

[4] "Development of a Dispersion Modeling Capability for Sea Breeze Circulations and other air flow patterns over Southeaster Massachusetts," performed by the Commonwealth of Massachusetts Department of Public Heath, January 2002, by Egan Environmental, Beverly, MA 01915. For correspondence with the author contact Dr. Bruce Egan, at eganenvir@aol.com or by mail: Egan Environmental Inc., 75 Lothrop St., Beverly, MA 01915, phone (978) 927-8122.

[5] U.S. Department of Energy, Boston Office, "Diversification Analysis – Natural Gas Supply/Wind Production, Albert Benson, Project Manager. June 6, 2004.

[6] U.S. Department of Energy, Ibid, Exhibit II.

b. The EIS should include a **cost comparison of a unit of energy production** (i.e., a kilowatt-hour) from the project with existing non-renewable energy alternatives. Specifically, what is the estimated cost of the project's energy compared to the current cost of energy from each of oil, natural gas (liquefied and gaseous), conventional coal, and nuclear.

   Consider the cost effect with and without renewable incentives such as the production tax credit and the sale of renewable energy certificates (REC) where applicable, and the probability that those incentives will exist and at what level at the estimated time of the project's completion. Note in the EIS that there is no guarantee that the production tax credit will be renewed or at what level, and that the Massachusetts Renewable Energy Portfolio Standard (RPS) is subject to current state legislative manipulations that may decrease or negate the value of future renewable energy certificates (RECs).

   Also note in the EIS incentives for fossil fuels and nuclear plants as compared to wind power. For example the impact of the royalty relief to energy companies taking oil and natural gas from the Gulf of Mexico, subsidies for synthetic coal and indeed the current production tax credit of 1.8 cents/kWh for new nuclear plants, etc.

c. More importantly, The EIS should include the **estimated impact on the price** of a unit of electrical energy produced by the project **on the end consumer**. For example, what will the impact of Cape Wind be on lowering the uniform clearing price of wholesale electricity at ISO NE and its integrated effect over a period of year? When this project bids in with a fuel cost of zero, estimate how much this will decrease the cost of electricity to the end consumer. And/or what will be the estimated impact on the future price of electrical energy be if the project's energy is sold on long term fixed price (10 to 20 year) contracts to local suppliers like the Cape Light Compact (presuming they will become a electrical cooperative hence allowed to enter into such a contract) or NStar.

d. The EIS should include national estimates of the **unit cost of externalities** related to the alternative energy sources as compared to the project. For example, the environmental cost of mining coal, the cost of processing and storing (long term) nuclear waste to produce a kWh of electricity, etc.

e. The EIS should include a **near term (next 5 to 7 years) unit energy cost comparison of the project with other zero polluting alternative energy sources** such as new hydro, land based wind, solar PV, tidal, ocean wave, and both shallow water and deep-water offshore wind. Include a unit energy cost **comparison to the near-zero polluting FutureGen coal project** (a one-billion dollar public-private sponsored project for a 275 MW plant including a 50 year lease in the federal RFP for a land area of 10 miles radius (some 300 square miles) for sequestering a million tons of carbon dioxide each year[7].

f. EIS to include a **decommissioning cost estimate for the project** with a comparison to decommissioning of alternatives that would restore to areas involved to their "before use" status (namely open and usable land). For example compare the decommissioning cost of a conventional fossil electric power plant or a nuclear plant (and storing its waste) to that of removing the equipment (decommissioning) for the Cape Wind project.

[7] "Pecos County locations would store byproduct from FutureGen plant," Knight Ridder/Tribune Business News - Bill Modisett Odessa American, Texas, April 28, 2006. FutureGen is the world's first near-zero emissions coal-fired power plant. The site is to be chosen by the fall of 2007 with groundbreaking set for 2008. The facility is to be operational by 2010.

3. Affected environment and environmental consequences

a. The EIS should include a comparison of the project environmental impacts with those of the alternatives.

b. The EIS should include a comparison of environmental impacts **in perspective and balance with other man-made impacts** based on the consensus of scientific opinion. For example, balance the expected bird-kill estimates of an off-shore wind turbine project with the bird kill from domestic cats, collisions with high-rise buildings, windows, automobiles, cell phone and radio broadcast towers. Is the project a danger to the extinction of a particular species in comparison to the alternatives or will it help perpetuate the species? For example, will the global warming caused by fossil fueled alternatives lead to the extinction of some bird species or polar bears that would be diminished by the project's zero carbon dioxide emissions? Include the recent considerations of the Massachusetts Audubon Society (by Jack Clark) on birds. Compare and consider the results of the 3 year in-depth bird studies conducted by the Danish authorities on their similar offshore wind farms at Horns Rev and Nysted.

c. The EIS should include a **comparison of the carbon dioxide sequestration costs per year** of fossil fueled electrical energy projects with that of the Cape Wind project. For example, I understand that the current cost of sequestering (using a deep earth reservoir) for a ton of carbon dioxide is about $100 per ton. The future hope is to reduce this to about $10 per ton. And there will undoubtedly be the need for the yearly lease of the land under which the carbon dioxide is sequestered. [Unfortunately I cannot find my reference for these costs, but I'm sure you can find such a reliable reference]. The Cape Wind project will not emit any carbon dioxide so the cost benefit of avoidance should be considered as another benefit for the project.

4. Beneficial impacts of the proposed Cape Wind Project

a. The EIS should include an assessment of **health benefits** of the project from avoiding the equivalent emissions for alternative fossil fueled plants. Consider not only the numbers of premature deaths avoided and related respiratory diseases but the equivalent monetary valuation. For example, apply the techniques and model of the Harvard study of estimated health impacts of criteria pollutant emissions from power plants[8] to estimate the human health impact in term of premature death avoidance, human suffering, and monetary valuation. Note, the EPA has attached the value of human premature death as $3.7 million dollars related to the benefits in terms of regulating pollution for cost-benefit analysis[9]. In addition note that the average number of life-years lost by individuals dying prematurely from exposure to particulate matter from fossil fueled power plant is 14 years[10].

   In an extrapolation of the Harvard study that I performed for the estimation of premature deaths avoided by replacing 1.5 million MWh of electrical energy from either of the regional Brayton Point or Salem Harbor power plants (coal and oil fueled units) with

[8] "Estimated Public Health Impacts of Criteria Pollutant Air Emissions from the Salem Harbor and Brayton Point Power Plants," Levy and Spengler, Harvard School of Public Health, May 2000.
[9] "E.P.A. Drops Age-Based Cost Studies," Katharine Seelye, New York Times, May 8, 2003, p. A26.
[10] "Dirty Air, Dirty Power," Clear the Air, June 2004.

non-polluting wind energy from Cape Wind shows that there would be a mortality offset of 15 fewer premature deaths each year. A copy of the letter from Dr. Levy, one of the Harvard authors, stating that my calculations are reasonable and the framework is appropriate is attached.

I would suggest that MMS do your own extrapolation to determine what statistical benefits of avoiding the sulfur dioxide and particulate emissions from the oil fueled units at Canal, Brayton Point and Salem Harbor plants and attach a monitory value to such avoided premature deaths as well as related reductions in respiratory and health care costs.

It can be certainly argued that wind power bid into the ISO wholesale market at zero fuel cost will bump off the top of the stack the most expensively generated electricity which currently is that from oil fueled generators and next most costly is from natural gas fueled generators.

b. The EIS should include an assessment of the **equivalent amount of oil and natural gas avoided** by the electrical energy production of the ocean AERU project. Use as a basis the mixture of sources in the adjacent ISO region of the most expensive (marginal) generators that would be avoided by bumping them off the clearing price stack. Note the fuel cost alone for generating electricity form an oil fired boiler is now about 8 cents/kWh[11], and from a modern combined cycle combustion gas turbine plant the fuel cost alone is about 5 cents/kWh. The cost of fuel for coal and nuclear is about 2 cents/kWh. Hence oil generated electricity with be at the top of an ISO bid stack, gas generated electricity next, then coal and nuclear. Ocean power generated electricity has zero fuel cost and is at the bottom of the bid stack so it will always get dispatched forcing the equivalent amount of oil generated electricity off the top of the bid stack where the clearing (for dispatch) price is set. Hence, this project will avoid consuming oil and perhaps natural gas (depending on future fuel prices).

c. The EIS should include an assessment of the **national security impact due to avoiding the importation of the equivalent oil and natural gas**.

d. The EIS should include an assessment of the **cost savings** (if any) per unit of use to the end users of energy provided by the project by avoiding the dispatch of the oil and gas generated electrical energy into the New England ISO grid.

e. The EIS should include an assessment of the **environmental benefits from avoiding the dispatch of fossil based electrical energy into the New England ISO grid**. For example, the reduction in damage from acid rain, nitrification of ponds and estuaries[12].

[11] The heat rate (efficiency) of an oil fired boiler generating plant is about 10,200 BTU/kWh and the current cost of residual fuel oil is about $52 per barrel according to the US Energy Information Agency. One barrel of residual is equivalent to 6,287,000 BTU. Calculation gives the cost of 8.3 cents/kWh for the fuel alone. The heat rate (efficiency) of gas fired combined cycle generating plant is about 6,700 BTU/kWh and the current cost of natural gas is about $8 dollars per million BTU on the spot market. Calculation gives the cost of fuel alone of about 5.5 cents/kWh for gas generated electricity.

[12] "Frequently Asked Questions About Atmospheric Deposition," EPA-453/R-01-009, September, 2001. And "Impacts of Atmospheric Pollutant on Aquatic Ecosystems," by Swackhamer, et. al., Issues in Ecology, No. 12, Summer 2004. And "Nitrogen in the Nation's Rain," National Atmospheric Deposition Program (NADP) Brochure 2000-01c (revised).

f. The EIS should include an assessment of the **potential environmental benefits from avoiding the impact of accidental ocean spills of fuel oil transportation to energy generating facilities** of the New England ISO region. For example, the history of oil spills in the Cape Cod Canal region transporting oil the ISO NE region's electrical generating plants.

g. The EIS should include an assessment of the **project's benefits derived from the avoidance of equivalent carbon dioxide emissions from electrical energy facilities** of the New England ISO region. Include a discussion of the scientific consensus of the impact on global warming in the region adjacent to the project. For example the sea raise impact on costal communities in New England and Cape Cod and the Islands in particular.

5. Cultural and Socioeconomic Impacts

a. For the EIS to address and include the impact of **aesthetics of above surface projects** (offshore wind turbines) leads to an intractable discussion. Some people love the looks of majestic turbines; some think they are simply ugly or worse. It is a case for environmental and social justice to say that they should be placed in someone else's view. All ocean views are exquisite, none arguably more or less than any other. This is not like building a windfarm in a unique terrestrial location like the Grand Canyon. **Hence the viewshed should be all but discounted in the EIS.**

   At most, the EIS should include a discussion of economic tradeoffs and risks and time scale of the alternative of placing the project far enough offshore to be out of the view. The costs estimates and risks of satisfactory developments in the foreseeable future, i.e. the next 10 years, should be included. For example, the first deepwater demonstration project undertaken by Talisman Energy, an oil and gas producer in the North Sea. It will consist of two newly designed five-megawatt (MW) wind turbines 14 miles off the Scottish coast in 150 feet of water. Perched on top of four-legged undersea lattice-type foundation structures, the two wind turbines will provide power to nearby oil and gas platforms in their Beatrice complex. The total cost of this project is $58 million dollars provided by Talisman, Scottish and Southern Energy (UK), and three government agencies[13]. This cost does not include the expensive high-voltage undersea cables that would be required to bring wind power ashore. Talisman will collect performance data, look for ways to reduce costs and develop operating procedures over five years to examine the feasibility and benefits of creating a future commercial deepwater wind farm at this site[14]. Compared to conventional shallow water offshore windfarms that cost about $2 million per MW installed[15], the fixed-pile foundation Talisman project at $5.8 million per MW is almost three times as expensive and prohibitively uneconomical in the near term.

[13] "Wind Farm Demonstration Project Launched," 2004 Talisman Corporate Responsibility Report. The project will receive $7 million from each of the Scottish Executive and the UK Department of Trade and Industry and $10 million from the European Commission. Talisman and their co-venturer in this project will each contribute over $17 million.

[14] Talisman reference in: http://www.talisman-energy.com/cr_online/

[15] "Offshore Wind Energy Potential for the United States," Walt Musial, National Renewable Energy Laboratory, Wind Powering America - Annual State Summit, May 19, 2005, Slide #4: Shallow offshore costs range from 2200 €/kW to 1500€/kW, Horns Rev ~1650€/kW.

b. Since the project is viewable from the shore, include an assessment of the **impact on tourism.** Although fraught with personal viewpoints the EIS should include a survey the tourism impact of existing world ocean projects (like offshore wind farms in Denmark, Sweden and the United Kingdom) that are similar to the project at hand.

   As one antidotal case of a change to a positive attitude by the public at large as well as community leaders I would urge you to review the enclosed video called "The View and The Vision." It is a documentary video produced by Clean Power Now on their visit to Denmark in 2005 to examine the impact of the Nysted offshore windfarm on attitudes, tourism, property values, the environment, and the results of this offshore project.[16]

c. The EIS should include an assessment of the **impact on adjacent property values** if the project is viewable from the shore. Again, the EIS should include a survey of the impact on adjacent property values of existing world ocean projects similar to the project at hand. For example, comparer to Horns Rev and Nysted offshore wind farms in Denmark and similar ones in the UK.

d. The **cultural impact based on the history of the region** could be included in the EIS. It should review the past history of technologies similar but more rudimentary than the proposed project. For example, is there a history of windmills in the area for the early salt industry and grain milling as there is in Cape Cod or for pumping water as in Holland? Are there artifacts that are preserved at historical sites in the region like restored windmill tourist attractions? Several exist on Cape Cod.

e. The EIS should include an assessment of the **impact on direct project employment** in the area of the project. How does it compare to the alternative of building elsewhere?

f. The EIS should include an **assessment of bringing research, development and manufacturing** of the project's technology to the region and compare it to implementing the project elsewhere.

g. The EIS should include an assessment on the impact to **national technology leadership and manufacturing** in the nation compared to choosing alternative existing technologies for the energy. For example, the small county of Denmark currently dominates the technology and manufactures 40% of the wind turbines in world market. Germany and Spain are close behind.

h. The EIS should include an assessment of the project on the **impact to national security** compared to implementing conventional oil and natural gas energy alternatives. Include the discussion in the face of diminishing natural fossil resources and the nation's need for access to energy especially from unfriendly and unstable foreign countries.

i. The EIS should include an assessment of the project's **impact on balance of trade**, meaning using the nation's wealth to purchase oil and natural gas from foreign countries instead of the alternative of implementing the energy project here.

j. The EIS should include an assessment of **the impact of prohibiting an energy project** due to overly burdensome requirements for a new technology with respect to casting a cloud on the initiation and permitting of similar projects in the near future, i.e. within the next 5 to 7 years.

[16] "The View and The Vision," Video Disk, Clean Power Now, by Argo Video.

Conclusion

Although the list of topics above is daunting, I suggest the MMS adopt a procedure to enable an EIS to be expedited and developed with reasonable financial resources within a 12 month period. I firmly believe there is an urgency for the need to develop considerable renewable non-polluting sources of energy for the security, sustainability and survivability of our nation.

Thank you for your consideration.

Charles W. Kleekamp, P.E. Ret.
Vice President, Cape Clean Air

About Cape Clean Air. Cape Clean Air is a non-profit volunteer organization with a mission to inform citizens of the unhealthful hazards of power plant emissions and to seek stringent emission regulations while supporting renewable non-polluting forms of energy.

Attachments**:**

1. Letter To Whom It May Concern, dated December 4, 2002, regarding estimates of mortality offset by the addition of 1.5 million MWh [from the Cape Wind project] of non-polluting electrical energy in Massachusetts, from Dr. Jonathan Levy, Assistant Professor of Environmental Health and Risk Assessment, Harvard School of Public Health.

2. “The View and The Vision,” Video disk on offshore wind power in Denmark, from Clean Power Now, produced by Argo Video.